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Seasonality, Habitat Preference and Life History of Some Willamette Valley Wet Prairie Terrestrial Molluscs in Western Oregon, USA

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Abstract. Willamette Valley wet prairie of western Oregon, USA is a seasonally inundated habitat that currently exists in small, highly fragmented reserves. Permanent traps in one wet prairie parcel were repeatedly sampled every five to ten days over three years in order to describe the terrestrial mollusc community. Ten species comprised the community: three exotic slugs (*Arion ater* s.l., *Arion hortensis* s.l., *Deroceras reticulatum*), five native snails (*Catinella rehderi, Cochlichopa lubrica, Monadenia fidelis, Vertigo modesta, Verpericola* cf. *depressa*), and two native slugs (*Deroceras laeve, Prophysaon andersoni*). The wet prairie mollusc community became more active with increased precipitation, with the snails having a longer active season than the slugs. There were also differences among species in the habitat they were trapped in (wet vs. dry) and the time of year they were sampled, indicating that the environment partially structures the terrestrial mollusc community. The presence of standing water in the wet prairie likely explained why many of the native species actively foraged diurnally under sunny conditions and the overlap of generations in reportedly "annual" species. The unique seasonal flooding of the wet prairie is a harsh condition for terrestrial mollusc existence and the habitat should be investigated further for new species and adaptive mollusc behaviors.

INTRODUCTION

Little is known about the terrestrial molluscs inhabiting Willamette Valley wetland prairie of western Oregon, USA, perhaps due to the rarity of the habitat. Once a dominant ecosystem along the 200 km long Willamette River floodplain, wetland prairie, like other North American prairies and wetlands has experienced drastic reductions in size. Before the 1850s, anthropogenic fires likely maintained the Willamette Valley wetland prairie as a grassland (Boyd, 1986), without which it succeeds to a wet Oregon ash (*Fraxinus latifolia* Benth. 1844) forest. The loss of habitat through urbanization, agricultural development, succession, and invasion of exotic species has left Willamette Valley wetland prairie highly fragmented. Currently, Willamette Valley wetland prairie estimates are circa 600 ha, which is considerably less than 1% of the historical breadth of the habitat not more than 150 years before the present (Christy & Alverson, 1994). Due to the high percentage of habitat loss, Willamette Valley wet prairie is considered to be one of the most endangered ecosystems in the United States (Noss et al., 1995).

Wetland prairie is a seasonally inundated grassland that has standing water from November through May. The perched water table is caused by a semi-impervious alluvial clay layer that is approximately 1 to 3 m below the soil surface (Finley, 1995). As precipitation increases, the water table level rises to exposure surrounding tussocks of the dominant native bunchgrass, *Deschampsia cespitosa* (L.) Beauv. 1753, creating small islands of terrestrial habitat (Figure 1). Eventually, the accumulated surface water evaporates by June and by July the soils are hard and occasionally cracked. A perennially dry mound habitat, which contains plant species characteristic of Willamette Valley upland prairie, persists due to a slight increase in elevation of less than a meter from the surrounding inundated habitat. This perennially dry habitat is likely a refuge from terrestrial molluscs when the lower regions of the prairie are flooded.

A history of repeated seasonal flooding in the wetland prairie has likely led to the evolution of endemic plant species adapted to the soil conditions, eight of which are listed as either endangered, threatened, or species of concern (Oregon Natural Heritage Program, 2001). Some endemic or wetland obligate faunal taxa are also known to occur in the Willamette Valley wet prairie but little is known about their distribution and life history (Lattin & Schwartz, 1986; Oregon Natural Heritage Program, 2001; Severns, 2003; Severns & Villegas, 2005). One of these species is informally named the "Bald Hesperion" (*Vespericola* cf. depressa) and appears to be limited to the confines of remnant wet prairie parcels in the southern Willamette Valley and nearby upland grasslands (Oregon Natural Heritage Program, 2001).

The Willamette Valley wet prairie terrestrial mollusc community has not been formally studied and has only been sporadically collected from in the past. Seasonal inundation and rapid evaporation of standing water in the

Figure 1. Photograph of the *Horkelia* Prairie Management Unit study site. The inset photo shows the "small islands" of terrestrial habitat in the inundated portion of the prairie.

wet prairie creates a dynamic and rapidly fluctuating habitat for terrestrial molluscs compared with the more environmentally stable forest floors of the Pacific Northwest. Given that there are endemic plants adapted to the seasonal flooding of Willamette Valley wet prairie there may similarly be unique terrestrial mollusc species other than *Vespericola* cf. *depressa* that have not yet been collected from this ecosystem. A multiyear repeated sampling of terrestrial molluscs in the southern Willamette Valley wet prairie parcel was initiated in 1999 to generate a species list of terrestrial molluscs for the site and to determine the effects of prescribed fire on the mollusc community (Severns, 2005). In this paper I describe a Willamette Valley wet prairie terrestrial mollusc community, temporal patterns in species' relative abundance, species' preference for microhabitats, and contribute life history observations from the three years of field study.

MATERIALS AND METHODS

Study site: I sampled a parcel of wet prairie managed by the US Army Corps of Engineers, located approximately 10 km west of Eugene, Oregon, USA (44°20′38″N, 123°10′03″W). The study site, *Horkelia* Prairie Management Unit (circa 4 ha and 114 m elevation) is typical tufted hairgrass (*Deschampsia cespitosa* (L.) Beauv.)-dominated Willamette Valley wet prairie habitat that has shallow, remnant furrows historically used (unsuccessfully) to drain the standing water for the creation of pasture. There is no evidence suggesting that the study site was used for crop cultivation. *Horkelia* prairie is primarily dominated by gaminoids, with occasional ash trees (*Fraxinus latifolia*) and serviceberry (*Amelanchier alnifolia* Nutt. 1834) that dot the landscape (Figure 1). Dominant wet prairie plant species at the study site other than *Deschampsia cespitosa* are: *Anthoxanthum odoratum* L. 1753 (exotic species), *Rosa nutkana* Presl. 1851, *Rubus armeniacus* L. 1874 (exotic species), *Horkelia congesta* var. *congesta* Dougl. 1829, *Camassia quamash* (Pursh) Greene 1814, *Aster hallii* Gray 1943, and *Grindelia integrifolia* Nutt 1836.

A semi-rural residential area with interspersed cultivated hay fields borders the east edge of the study site and Rose Prairie Research Natural Area unit is to the north. *Horkelia* Prairie is bounded on the south by a canal constructed in the 1950s that separates the study site from the Amazon unit of the wet prairie Research Natural Area. To the west the study site is confined by Fern Ridge Reservoir and to the northeast the wet prairie habitat transitions into a small, degraded white oak (*Quercus garryana* Doug. ex Hook. 1840) forest that was not part of the surveyed habitat.

The climate of western Oregon and the study site is Mediterranean. A weather station approximately 6 km northeast of the study site receives approximately 104 cm of mean annual rainfall, with 86% of the annual precipitation occurring from November through June. The mean annual temperature is mild, 11.2°C, with the coldest month having a mean temperature of 3.9°C (January), and the warmest month (July) averaging 19.1°C (National Weather Service, 2002).

Mollusc sampling: I used coverboards, 0.6 m × 0.6 m pieces of 1 cm thick plywood, to sample terrestrial molluscs at the study site because trapping overcomes some sampling bias (Boag, 1982) and it may be more easily replicated by novices compared to hand searching (Ward-Booth & Dussart, 2001). The coverboards sampled a gradient of wet and dry habitats within the study site and their position was permanent. The distance between traps (n = 21) ranged from approximately 8 to 40 meters. I estimated the cover of standing water. beneath the coverboard to the nearest 1% for 1–10% covers and in 5% increments thereafter. Coverboards were also placed in an adjacent burned area, but I chose to present only the coverboard data from the unburned portion of the study (n = 21 coverboards) because some species were not detected in the burned area (Severns, 2005). I sampled all coverboards every 5 to 10 days throughout three terrestrial mollusc active seasons, October–July of 1999–2002. In year 1 (1999/2000) I checked the coverboard arrays on 42 occasions, while in year 2 (2000/2001) the site was visited 41 times, and in year 3 (2001/2002) on 29 occasions. Traps were checked before 1300 hr on days following nights that were favorable for mollusc activity, generally mild temperatures and high relative humidity. I recorded the number and species of terrestrial molluscs encountered on top of and adhered to the underside of the coverboard as well as the ground below the coverboard. When encountered, dead snails were counted and then discarded from beneath coverboards so that resampling of dead individuals was avoided. Live molluscs censused using the coverboards were left *in situ* except for a small number of voucher specimens of each species when required for a positive identification. These voucher specimens were deposited in the Oregon State Arthropod Collection (OSAC) with individual bar codes for six species (See Table 1) and the remainder deposited under accession #00133. I used trap efficiency, the number of molluscs captured per trap unit, as an index for relative mollusc abundance. For monthly estimates of mollusc abundance, the total number of captures was divided by the number of traps multiplied by the number of days sampled in the month. I considered a trap having less than 3% standing water during the time interval that the wet prairie maintains standing surface water to be perennially dry habitat. Molluscs were identified using Pilsbry (1939, 1940, 1946, 1948) and Burch and Pearce (1990). *Arion ater* and *Arion hortensis* were identified *sensu lato* although segregates of each species complex are recognized (e.g., Rollo & Wellington, 1975; Davies, 1977; Pearce & Bayne, 2003).

Table 1

Total number of species captures and the percent of captures occurring under dry mound coverboards.

Species	Total # of captures	% captures on dry mounds (<3% water)
Vespericola cf *depressa*	1784	46.4
Deroceras reticulatum Müller 1774	424	60.4
Deroceras laeve Müller 1774	372	20.7
Catinella rehderi Pilsbry 1948	148	23.6
Arion hortensis s.l. Férussac 1819	52	92.3
Monadenia fidelis Gray 1834	29	75.9
Vertigo modesta Say 1824	20	85.0
Prophysaon andersoni Cooper 1872	19	73.7
Arion ater s.l. L. 1758	16	81.3
Cochlicopa lubrica Müller 1774	5	80.0

* OSAC specimen numbers: 44544, 44546, 44547, 44551–44563, 44583–44588.

RESULTS

Community: There was a total of 2869 mollusc observations from checking the coverboard array 112 times in the three years of sampling (Table 1). I detected ten species in the study site. *Vespericola* cf. *depressa* was the dominant species, followed by *Deroceras reticulatum* Müller 1774, *Deroceras laeve* Müller 1774, *Catinella rehderi* Pilsbry 1948, *Arion hortensis* s.l. *Férussac 1819, Mondenia fidelis* Gray 1834, *Vertigo modesta* Say 1824, *Prophysaon andersoni* Cooper 1872, *Arion ater* s.l. *L. 1758, and Cochlicopa lubrica* Müller 1774 (Table 1). Nine species were trapped in the first year of sampling and the last species, *Cochlicopa lubrica*, was captured during December of the second year. Total site diversity calculated using the Shannon Index (Magurran, 1988) was H′ = 1.22 for the pooled three years of data.

Accumulation of precipitation and seasonality were consistent indicators of community activity and relative abundance during the sampling period. Plotting mean daily rainfall by month against monthly coverboard trap efficiency showed that the wet prairie mollusc community as a whole became more active with increasing precipitation (Figure 2). Snails were more abundant than slugs in the early fall and late spring/early summer, extending

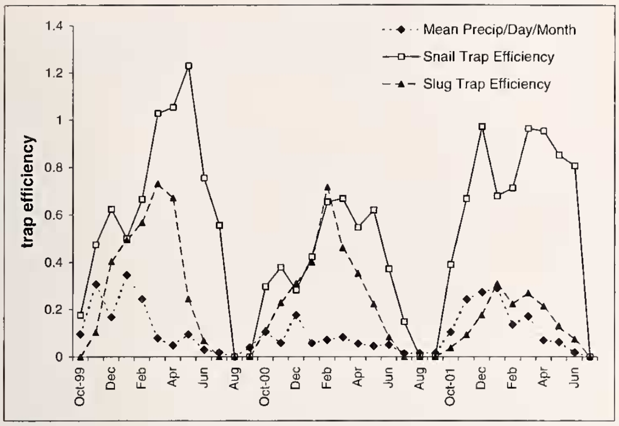

Figure 2. Mean daily precipation by month and monthly trap efficiency for slugs and snails over three active seasons.

their growing season past that of the slugs which peaked in late winter (Figure 2). The native species *Vespericola* cf. *depressa, Catinella rehderi*, and *Deroceras laeve* decreased in abundance in January, the coldest month of the year, while the exotic slug species *Deroceras reticulatum* and *Arion hortensis* increased in relative abundance during the same time (Figure 3).

Species accounts: *Vespericola* cf. *depressa* was encountered throughout the year from October through June (Figure 3) and was also active in the summer months of July, August, and September on humid days during and following thunderstorms. Although the relative abundance of *Vespericola* generally decreased during the winter (Figure 3), some individuals were active beneath coverboards on days that were below freezing and snowing. In February and March, *Vespericola* were often found covered with mud, suggesting that they spent time below ground during the winter. This species foraged diurnally on mild (<20°C), overcast and partly sunny days when the relative humidity was high. *Vespericola* consumed the biofilm that accumulated beneath the coverboards, fungal mycelia, green algal mats that remained after the inundated part of the wet prairie dried in May, and unidentified plant seedlings.

Vespericola were evenly distributed between the wet coverboards (>3% mean standing water) and the perennially dry traps (Table 1). Adults and subadults were found in both dry mound and wet habitats, but neonate snails (up to 3–5 individuals/coverboard) were encountered under the dry mound traps 80% of the time (n = 25 observations) suggesting that *Vespericola* eggs were laid near the mound coverboards.

Crushed *Vespericola* shells were found in the nests of shrews (*Sorex vagrans* Baird) and deer mice (*Peromiscus maniculatus* Wagner) under dry mound coverboards. Occasionally *Pterostichus* sp. (Carabidae) and rove beetles (Staphylinidae) were present under the coverboards but only a handful of intact shells were found (27 individuals), suggesting that snail predation by beetles is rare. None of the *Vespericola* shells at the study site had holes near their aperture indicative of *Ancotrema* sp. predation.

Deroceras reticulatum, an exotic slug and the second most abundant species, slightly preferred dry mound habitat over the wetter intermound areas (Table 1) but was rarely found under coverboards that had more than 20% standing water present (4 of 424 wet coverboard observations). *D. reticulatum* became increasingly common in the late fall and declined markedly in abundance beginning in May (Figure 3). It seemed to prefer a cool, moist climate and appeared to be greatly stressed when air temperatures exceeded 21°C. More than 90% of the individuals observed had wounds or scars on the dorsal and lateral tail regions but I did not directly observe antagonistic behavior in this species. Eggs of this species were also encountered under dry coverboards in the months of January, February, March, and April. Adults readily ate Romaine lettuce in captivity but I had no direct observations of herbivory in the field.

Deroceras laeve, the dominant native slug, preferred wet areas with standing water over dry mound habitat (Table 1) and was most abundant during the rainiest portion of the wet season, from November–April (Figure 3). Throughout the winter (December–March) *D. laeve* commonly foraged in full daylight on rainy, overcast, and even sunny days above freezing but less than 10°C. *Deroceras laeve* was associated with the ant mounds constructed by *Formica occulta* Francoeur. In the winter, when the ants were not at their peak activity, *D. laeve* were on the outside and inside of the ant mounds and consumed the middens from the colony. *D. laeve* also consumed the biofilm on the underside of the coverboard and unidentified plant germinants, but the species may be discriminating herbivores as they refused Romaine lettuce in captivity. In March of 2002, I observed three *D. laeve* consuming a wounded earthworm (*Lubricus terrestris* L.) that had partially drowned in shallow water, suggesting carnivory in this species.

Catinella rehderi, like *Deroceras laeve*, had a strong affinity for wet microhabitats (Table 1) and the two species were often found beneath the same traps. *C. rehderi* consumed cotyledons of two leguminous plants, *Lupinus sulphureus* ssp. *kincaidii* (Smith) Phillips and *Lotus formosissimus* Greene, and also grazed on biofilm that coated the coverboards and decomposing vegetation. In late April and early May (all three years), *Catinella rehderi* rested atop coverboards on sunny days that exceeded 22°C. These individuals died in the subsequent days (apparent desiccation) and were adhered to the exposed surface of the coverboard. I encountered live *C. rehderi* beneath the same coverboard that dead snails were adhered to.

Monadenia fidelis, Arion ater s.l., *Arion hortensis* s.l., *Prophysaon andersoni, Cochlicopa lubrica*, and *Vertigo*

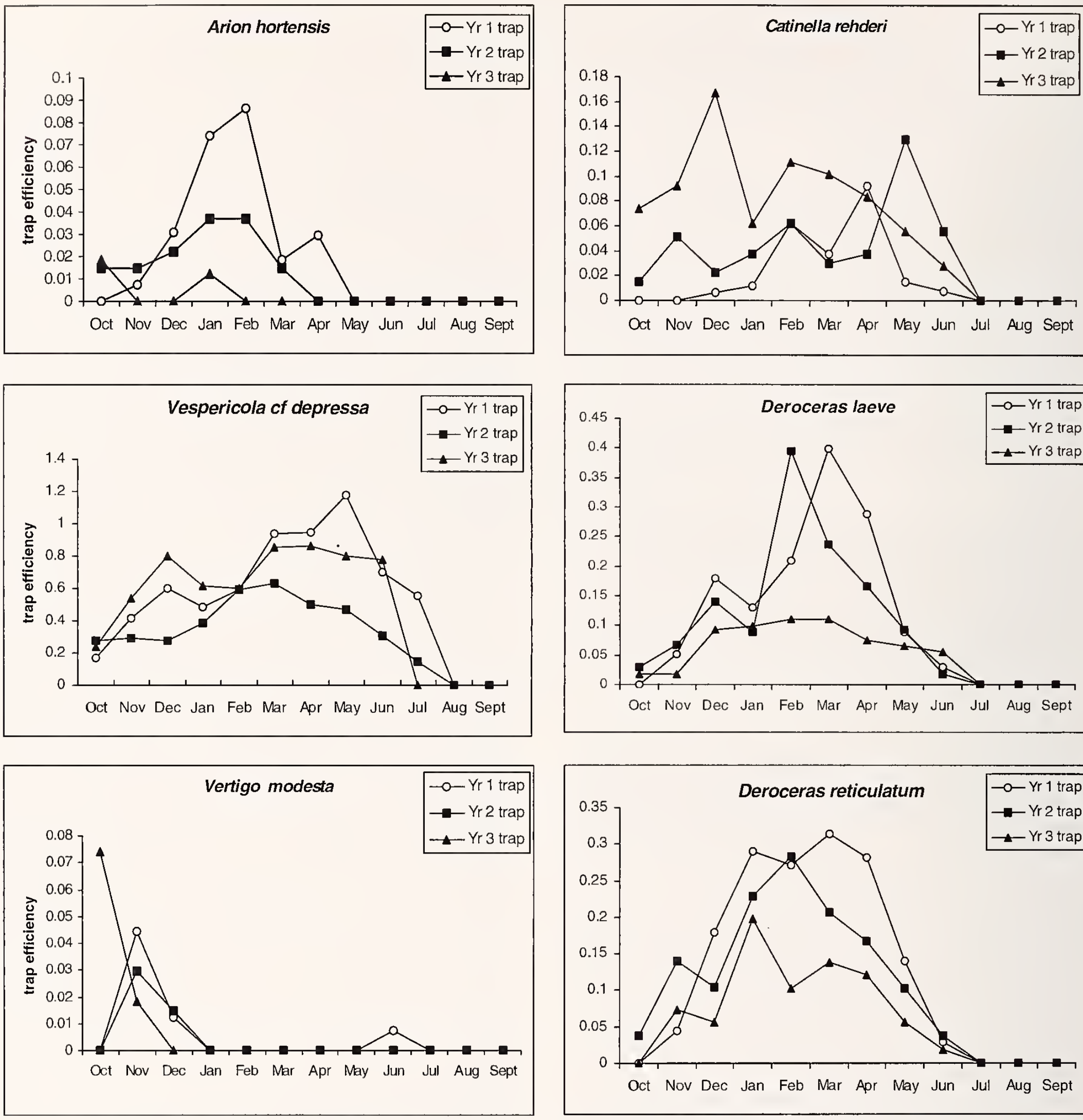

Figure 3. Monthly trap efficiency for six species of wet prairie molluscs over three active seasons.

modesta were uncommon or rare species at the study site. All six species were more frequently encountered under dry coverboards than semi-inundated traps (Table 1). *Monadenia fidelis, Prophysaon andersoni, Cochlicopa lubrica,* and *Arion ater* were active throughout the year, whereas *Vertigo modesta* and *Arion hortensis* displayed strong seasonality trends. *Arion hortensis* was most abundant in the winter months January and February (Figure 3). *Vertigo modesta* activity patterns were seasonally bimodal, appearing during the mid-fall after the rains began but before there was standing water on the prairie and also in the late spring as the prairie dried out (Figure 3). *V. modesta* grazed on the algal and microbial layer growing on the underside margins of the coverboards, and occasionally foraged on dead but prostrate grass stems.

Monadenia fidelis and *Prophysaon andersoni* were infrequently encountered but appeared to be actively moving about the study area. Both species were frequently captured once under a coverboard and were not generally recaptured at the same trap during the same year, suggesting that both the slug and the snail may be wide ranging. *Monadenia fidelis* found in a wet prairie parcel less than 0.3 km to the south of the study site were common and appeared to be tightly associated with small mammal holes, often found inside the mouth of the small mammal burrow. Furthermore, in the winter and early spring, *M.*

fidelis foraged diurnally and consumed the thallus of reindeer lichen *Cladina mitis* (Sandst.) Hustich 1918, unindentified plant cotyledons and young, tender foliar plant tissue.

Multiple overlapping generations of the reportedly "annual" species *Deroceras reticulatum, Deroceras laeve, Catinella rehderi, Arion ater,* and *Cochlicopa lubrica* were found beneath coverboards during the fall, winter, and spring, indicating that these species are likely not "annual" in the wet prairie study habitat.

DISCUSSION

Regionally, the wet prairie parcel I surveyed has low species richness compared to the richest forested Pacific Northwest habitats but has comparable species numbers to slightly disturbed sites and forests with lower plant diversity (Branson, 1977; Cameron, 1986). A diversity of ten species is either intermediate or on the lower end of Pacific Northwest mollusc study site diversity, but three of the ten Willamette Valley wet prairie species were exotic slugs, *Arion ater, Arion hortensis,* and *Deroceras reticulatum*, suggesting the native mollusc richness is low. I considered *Cochlicopa lubrica* to be native to the wet prairie despite the presence of human housing developments, which have been suggested by Roth and Pearce (1984) to be sources for non-native *C. lubrica* genotypes. With only seven native species found in the three years of sampling, the wet prairie study site has a comparably low native species component to other Pacific Northwest ecotypes (Cameron, 1986). Low species richness at the wetland prairie study site is not unexpected because grassland and old-field terrestrial mollusc diversity is usually lower than that of nearby forested habitats in North American temperate climates (Karlin, 1961; Gleich & Gilbert, 1976; Cameron, 1986; Ports, 1996; Nekola, 1999) and the potentially harsh environmental conditions in the wetland prairie are unlikely to support a rich terrestrial mollusc community. Moreover, a history of at least semi-annual anthropogenic fires set by native Americans that burned entire portions of the Willamette Valley (Boyd, 1986) may have resulted in the loss of historical mollusc diversity as prescribed burning was associated with lower wet prairie mollusc richness and abundance (Severns, 2005). Similar reductions in terrestrial mollusc richness and abundance following fires in dry grasslands and forests have also been documented (Nekola, 2002; Kiss & Magnin, 2003).

However poor, the wetland prairie mollusc diversity may be compared to nearby coniferous forests in the Coast Range and Cascade Mountains. The wetland prairie mollusc community is unique because there are few mollusc species found in the wetland prairie that are characteristically associated with Pacific Northwest *Pseudotsuga menziesii* (Mirbel) Franco 1825 (Douglas-fir) forests. *Monadenia fidelis* is found in both fir-forests (Branson, 1977; Cameron, 1986) and the Willamette Valley wetland prairie, however the wetland prairie race is diminutive (about half the size of *Monadenia fidelis* found in fir-forests) suggesting that it may be distinct from the typical Douglas-fir forest race. *Vespericola depressa*, likely the closest related species to the wet prairie *Vespericola* (2002, B. Roth, personal communication) occurs in tallus slopes near the Columbia River gorge, 280 km to the north of the study site (Pilsbry, 1940). Adult wetland prairie *Vespericola* lack shell setae, similar to *Vespericola depressa*, and both species occupy non-forested habitats. Another *Vespericola* species, one with shell setae, exists sympatrically with the wetland prairie *Vespericola*, except that it lives in the nearby *Quercus garryana* woods bordering Willamette Valley upland prairie. Neither of the above described *Vespericola* species are the typical types found in Douglas-fir forests, but Douglas-fir is slowly invading the Willamette Valley floor and the study site, primarily through human efforts. These Douglas-fir forests are relatively young, circa 100 years old, but they may create a corridor for the dispersal of typical Douglas-fir forest mollusc species into the wetland prairie. Evidence for recent mollusc dispersal coinciding with human modification of forests may reside in the presence of *Prophysaon andersoni* in the wet prairie. *P. andersoni* is frequently encountered on disturbed edges of young Douglas-fir forests (personal observation).

Seasonality and the presence of standing water appeared to give some structure to the wet prairie mollusc community. In general, mollusc activity on the wet prairie appears dependent on accumulated precipitation. Once the wet prairie fills with standing water, the soils remain saturated through May despite a lack of substantial precipitation, perhaps extending the season of mollusc activity relative to nearby drier upland prairie habitats. Furthermore, some species like *Catinella rehderi* and *Deroceras laeve* were tightly associated with flooded microhabitats whereas the other species appeared to prefer drier microhabitats. Snails emerged earlier than slugs and also remained active longer in the wet prairie (Figure 2). Presumably, having a shell allows snails to remain active under semi-dry conditions that slugs in the wet prairie do not tolerate, however within the group of slug and snail species there appeared to be an effect of seasonality on patterns of abundance (Figure 3). These patterns of seasonality indicate that sampling and monitoring the wet prairie terrestrial mollusc community should span the whole active season as some species peaked in abundance during the summer and others were present primarily in the fall and spring (Figure 3).

A severe drought occurred during the active mollusc seasons of year 2000/2001 (year 2). Precipitation in the drought year was nearly half of the normal mean yearly rainfall (National Weather Service, 2002) and as a result the study site did not have the amount of standing water that is normally present and soils became dry earlier in the year. This lack of standing water appeared to affect snail abundance during the drought year, but slug abundance did not decrease until the following year (Figure 2). *Vespericola* cf. *depressa* and *Monadenia fidelis* snails were associated with small mammal burrows and tunnels, often being covered in mud even during the wettest months of the year. In the drought year, snails may have moved to small mammal burrows to seek refuge from the warm temperatures and lack of precipitation, resulting in low trap efficiency during the drought. Contrary to the snails, slugs were either encountered sheltering beneath coverboards, under tussocks of the dominant bunchgrass *Deschampsia cespitosa*, or beneath scattered patches of thatch that were approximately 2 cm in thickness. During the drought year, coverboards likely provided temporary shelter for slugs which were sampled efficiently by traps. However, the drought year's slug cohort likely had low survival explaining the decline in the slug population the year following the drought while snails were trapped at relatively comparable levels to the normal precipitation year (Figure 2). Moreover, both the native slug (*Deroceras laeve*) and the two exotic slugs (*Deroceras reticulatum, Arion hortensis*) had similar patterns of drought and post-drought year patterns (Figure 3), suggesting that the drought affected all slugs, not just a subset of them.

Seasonal flooding and the fluctuation of standing water in the wetland prairie is likely related to some of the mollusc behavior observed in the three years of field study. Some species, *Deroceras laeve*, *Vespericola* cf. *depressa*, and *Monadenia fidelis* commonly foraged diurnally at the study site despite being reported as primarily nocturnal species (Getz, 1963) or species whose conspecifics are nocturnal (Roth & Pressley, 1986; Szlavecz, 1986). It seems plausible that the high relative humidity created by the standing water in the wet season may allows for diurnal foraging without a high risk of dehydration. Additionally, the presence of standing water and relatively mild temperatures likely explains the overlap of generations in some "annual" species that are reported to have a single synchronous lifestage cohort (Boag & Wishart, 1982). Either the high humidity and mild temperatures extend the lifespan of "annual" species like *Deroceras laeve*, or the active season is long enough to allow multiple cohorts to be produced.

Deroceras laeve is often collected from "wet" habitats (DeWitt, 1955; Rollo & Wellington, 1979; Boag & Wishart, 1982; Ports, 1996; Frank, 1998) and at the study site it preferred wet coverboards over the dry ones (Table 1), demonstrating a consistent affinity for wet habitats across the range of the species. Curiously, Pearl (1902) noted that *D. laeve* moved into standing water with decreasing temperature and left the water with increasing temperature. I observed no behavior suggesting that *D. laeve* chose to be submerged at any time of the year, but the slugs did appear to be content in shallow water conditions when their pneumostome was not submerged.

The other wetland prairie mollusc species preferring an inundated habitat is *Catinella rehderi* and it was often found in cohabitation with *Deroceras laeve*. *Catinella rehderi*, however, had a conspicuous and unexplained behavior at the study site. Some individuals of *C. rehderi* appeared to "commit suicide" by resting atop of coverboards on warm, sunny days in April/May and exposing themselves to direct sun for the entire day. Not all *Catinella rehderi* had this behavior and I noticed no ocular tentacle swelling that would suggest a nematode parasite in the individuals crawling atop the coverboards on warm, sunny days. It is unclear if the coverboard was an attractive resting surface for the snails and they inadvertently died from choosing an exposed resting site or that *C. rehderi* is a host to a parasite that alters resting behavior.

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